

## CHAPTER 4

### POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE NONCONNAH CREEK WATERSHED

#### 4.1 Background.

#### 4.2. Characterization of HUC-11 Subwatersheds

##### 4.2.A. 08010211020

##### 4.2.B. 08010211040

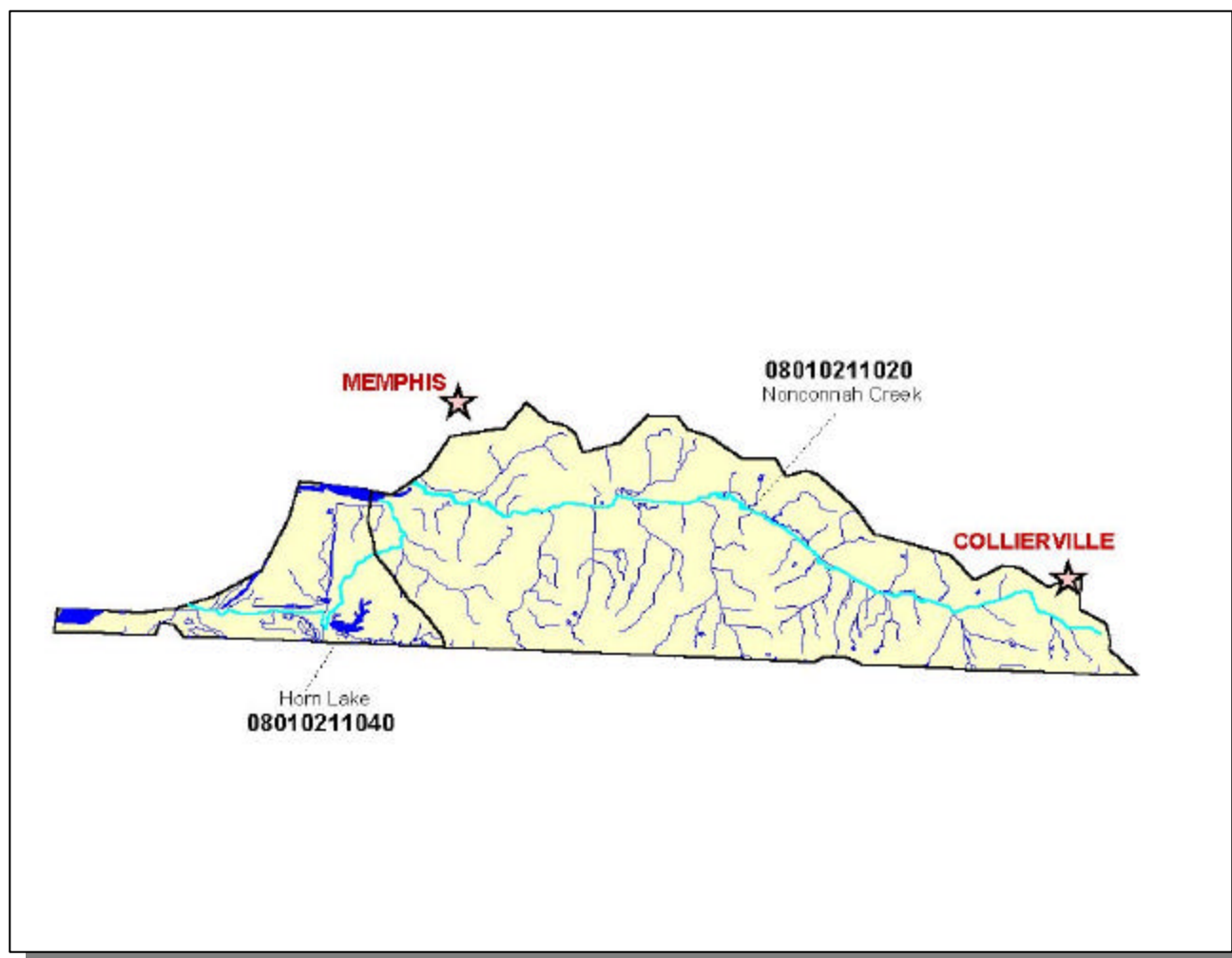
**4.1 BACKGROUND.** This chapter is organized by HUC-11 subwatershed, and the description of each subwatershed is divided into four parts:

- i. General description of the subwatershed
- ii. Description of point source contributions
- ii.a. Description of facilities discharging to water bodies listed on the 1998 303(d) list
- iii. Description of nonpoint source contributions

Information for this chapter was obtained from databases maintained by the Division of Water Pollution Control or provided in the WCS (Watershed Characterization System) data set. The WCS used was version 1.1 beta (developed by Tetra Tech, Inc for EPA Region 4) released in 2000.

WCS integrates with ArcView<sup>®</sup> v3.1 and Spatial Analyst<sup>®</sup> v1.1 to analyze user-delineated (sub)watersheds based on hydrologically connected water bodies. Reports are generated by integrating WCS with Microsoft<sup>®</sup> Word. Land Use/Land Cover information from 1992 MRLC (Multi-Resolution Land Cover) data are calculated based on the proportion of county-based land use/land cover in user-delineated (sub)watersheds. Nonpoint source data in WCS are based on agricultural census data collected 1992–1998; nonpoint source data were reviewed by Tennessee NRCS staff.

**4.2. CHARACTERIZATION OF HUC-11 SUBWATERSHEDS.** The Watershed Characterization System (WCS) software and data sets provided by EPA Region IV were used to characterize each subwatershed in the Nonconnah Creek Watershed. HUC-14 polygons were aggregated to form the HUC-11 boundaries for data analysis.

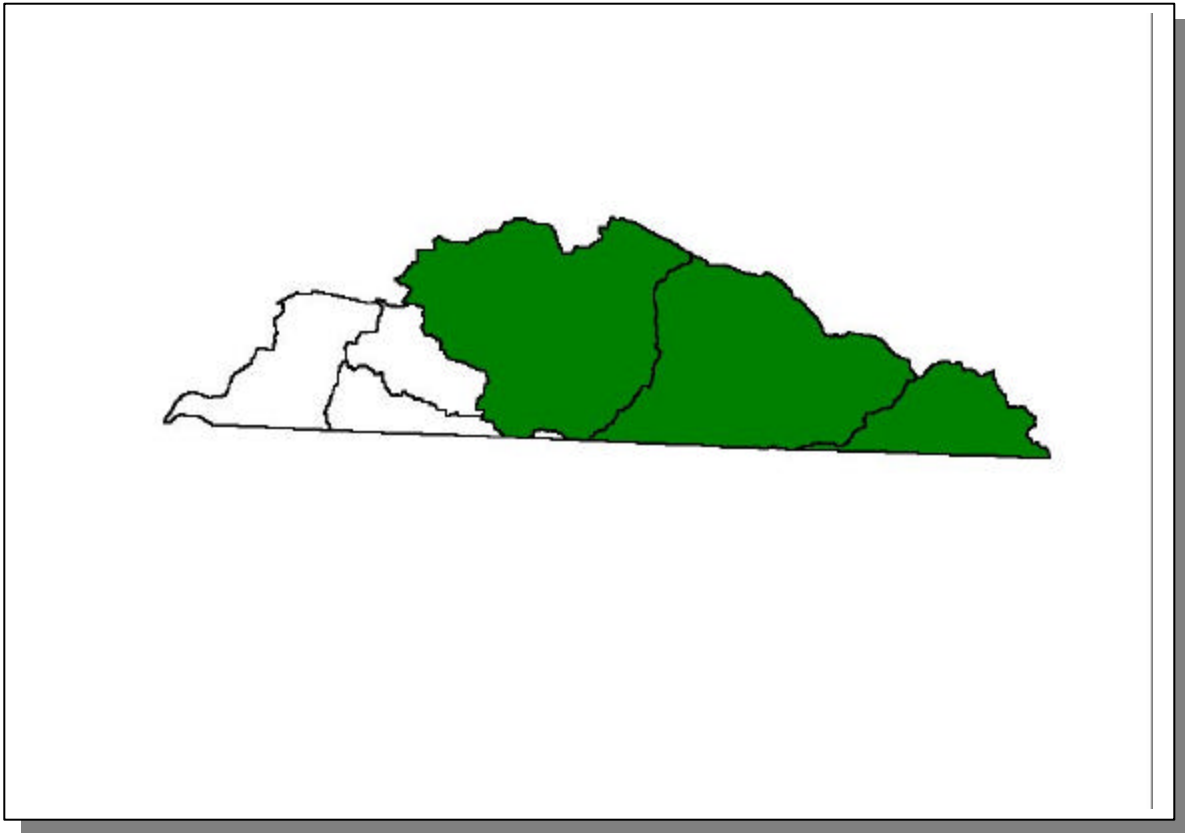


**Figure 4-1. The Nonconnah Creek Watershed is Composed of Two USGS-Delineated Subwatersheds (11-Digit Subwatersheds).** Locations of Nonconnah Creek, Memphis, and Collierville are shown for reference.

HUC-11	HUC-14
08010211020	08010211010010 (Nonconnah Creek) 08010211010020 (Nonconnah Creek) 08010211010030 (Nonconnah Creek)
08010211040	08010211020010 (Cypress Creek) 08010211030010 (Horn Lake Creek) 08010211030020 (Horn Lake)

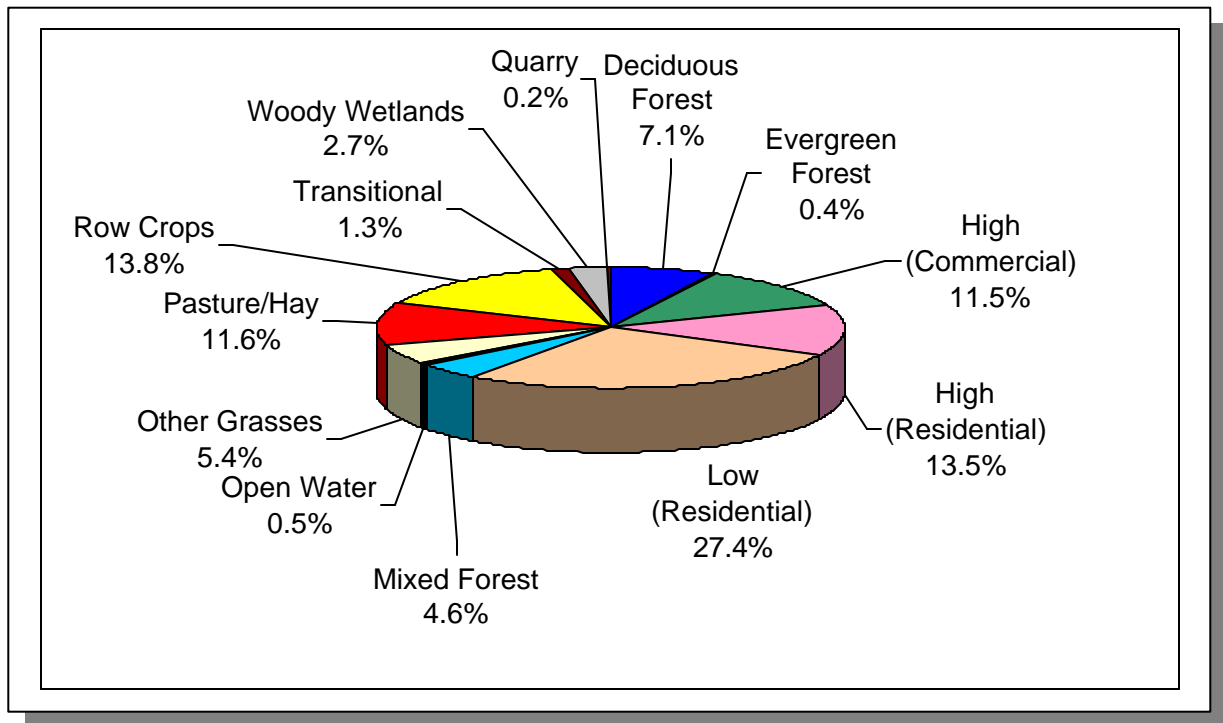
**Table 4-1. HUC-14 Drainage Areas are Nested Within HUC-11 Drainages.** USGS delineated the HUC-11 drainage areas. NRCS inventories and manages the physical database for HUC-14 drainage areas.

**4.2.A.** 08010211020.

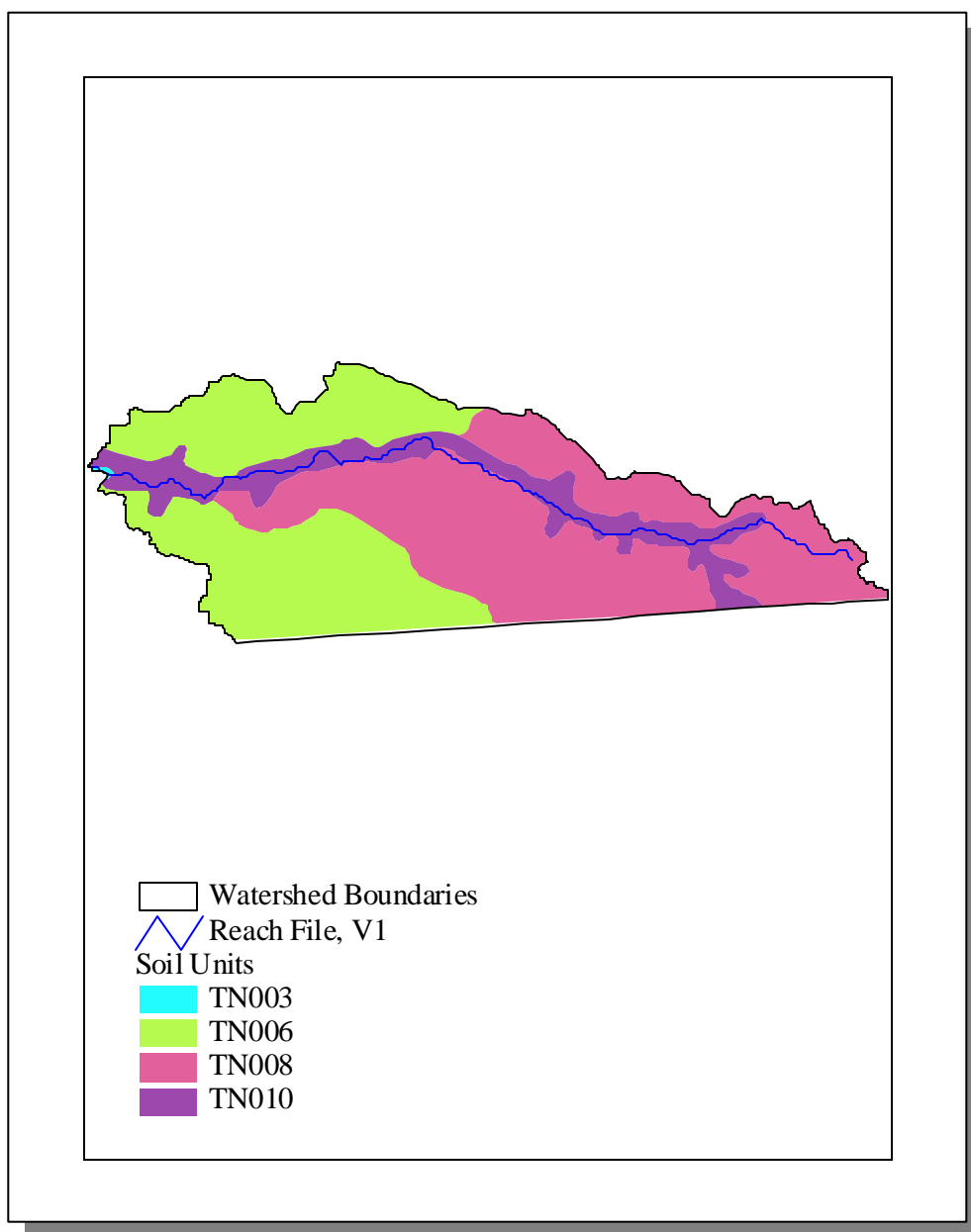


**Figure 4-2. Location of Subwatershed 08010211020.** All Nonconnah Creek HUC-14 subwatershed boundaries are shown for reference.

**4.2.A.i. General Description.**



**Figure 4-3. Land Use Distribution in Subwatershed 08010211020.** More information is provided in Nonconnah-Appendix IV.



**Figure 44. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 08010211020.**

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN003	62.0	C	0.50	6.65	Silty Clay	0.33
TN006	0.0	C	1.30	5.42	Silty Loam	0.48
TN008	2.0	C	1.38	5.20	Silty Loam	0.48
TN010	81.0	C	1.33	5.11	Silty Loam	0.44

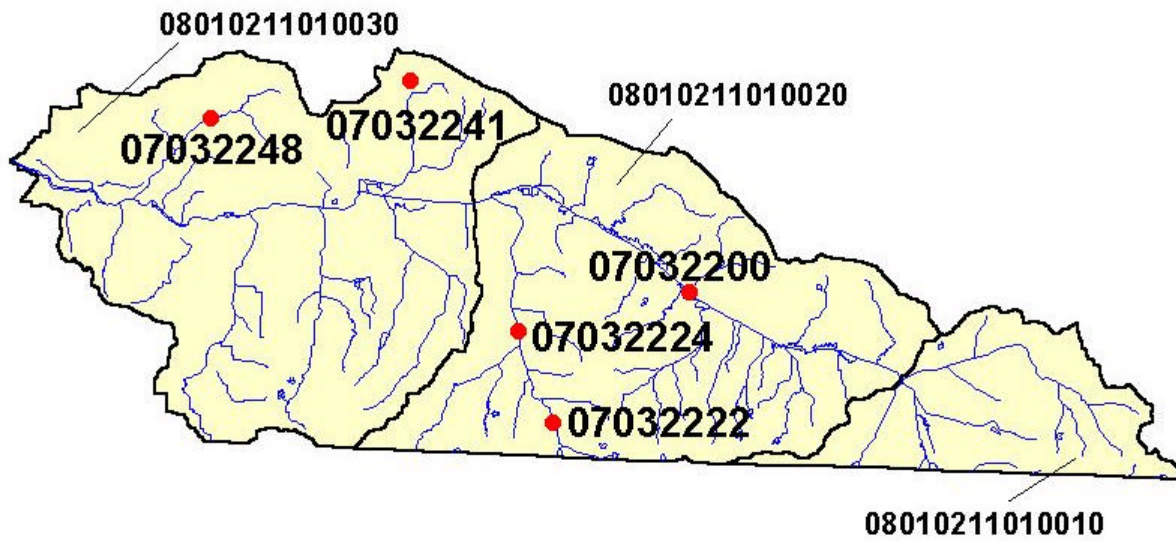
**Table 42. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 08010211020.** More details are provided in Nonconnah-Appendix IV.

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Fayette	25,559	29,412	0.14	35	40	14.3
Shelby	826,330	865,318	17.73	146,521	153,435	4.7
<b>Totals</b>	<b>851,889</b>	<b>894,730</b>		<b>146,556</b>	<b>153,475</b>	<b>4.7</b>

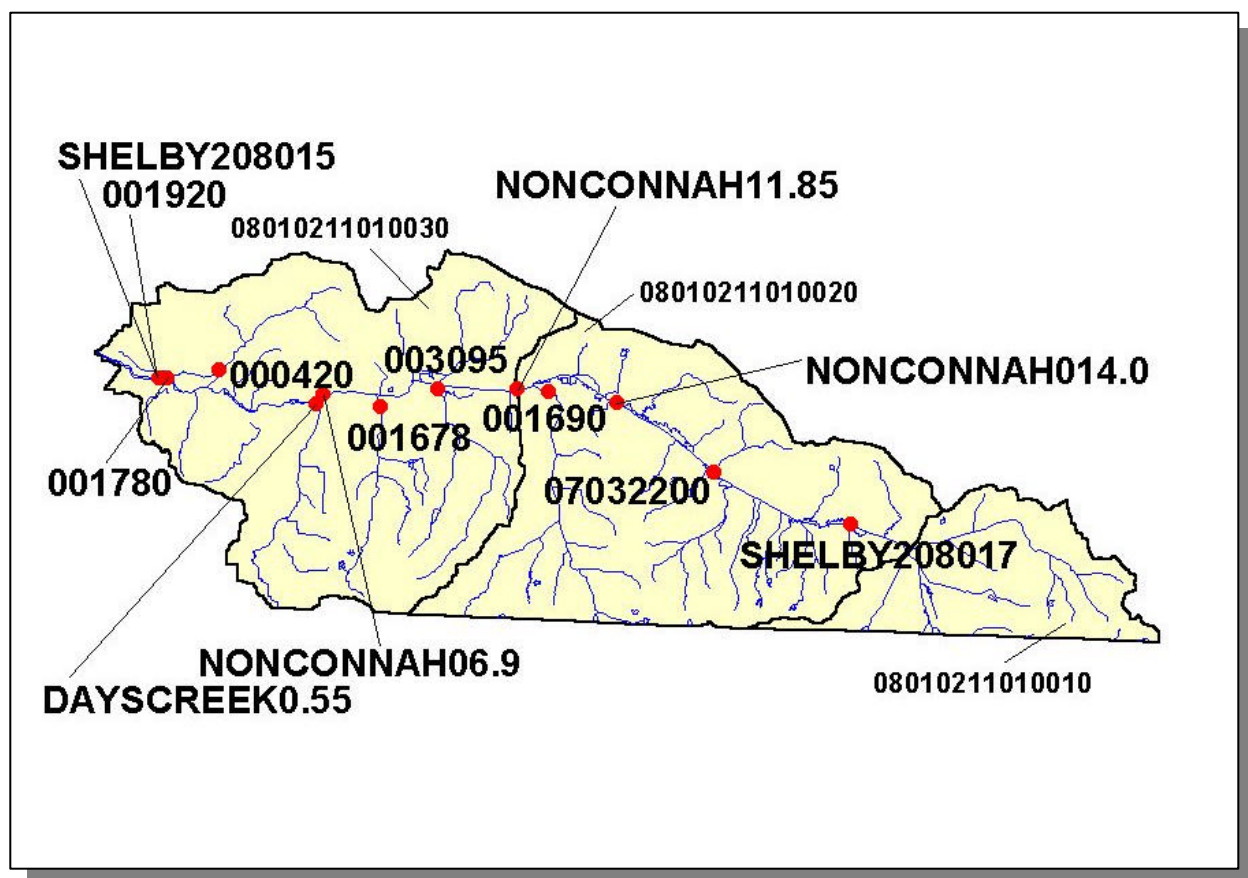
*Table 4-3. Population Estimates in Subwatershed 08010211020.*

NUMBER OF HOUSING UNITS						
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Collierville	Shelby	14,427	4,613	4,512	84	17
Germantown	Shelby	32,893	11,131	11,017	114	0
Memphis	Shelby	610,337	248,573	247,138	793	642
Piperton	Fayette	621	256	23	224	9
<b>Totals</b>		<b>658,278</b>	<b>264,573</b>	<b>262,690</b>	<b>1,215</b>	<b>668</b>

*Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 08010211020.*



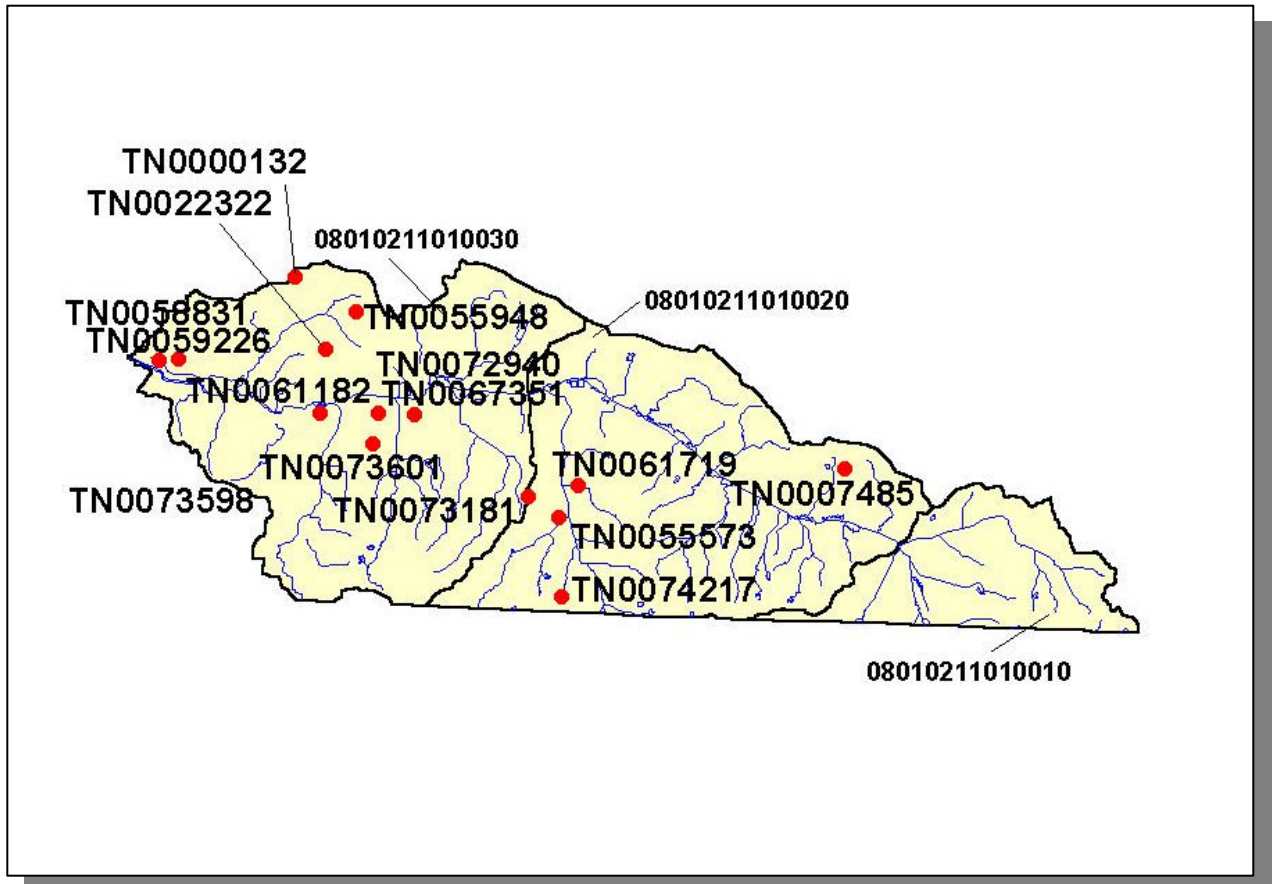
**Figure 4-5. Location of Historical Streamflow Data Collection Sites in Subwatershed 08010211020.** Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.



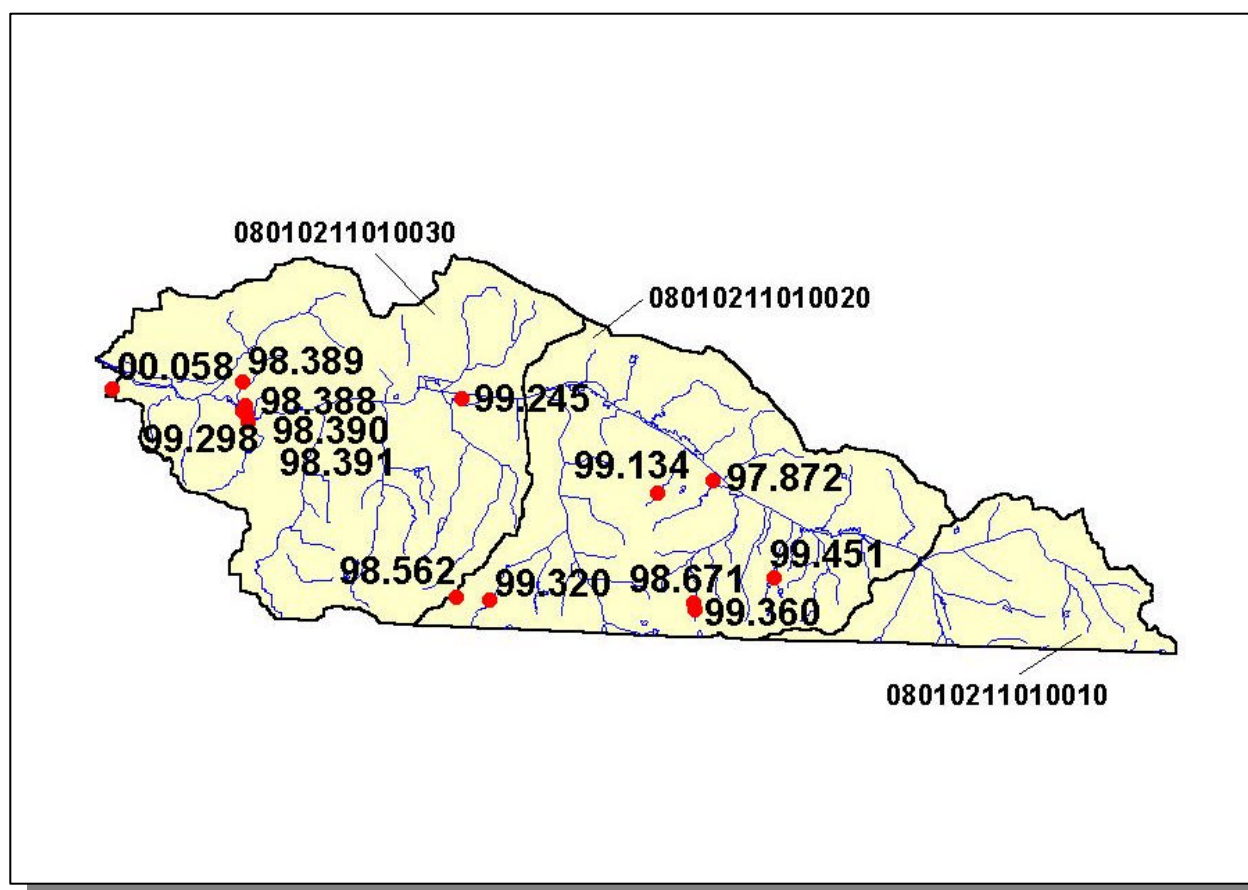
**Figure 4-6. Location of STORET Monitoring Sites in Subwatershed 08010211020.** Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.



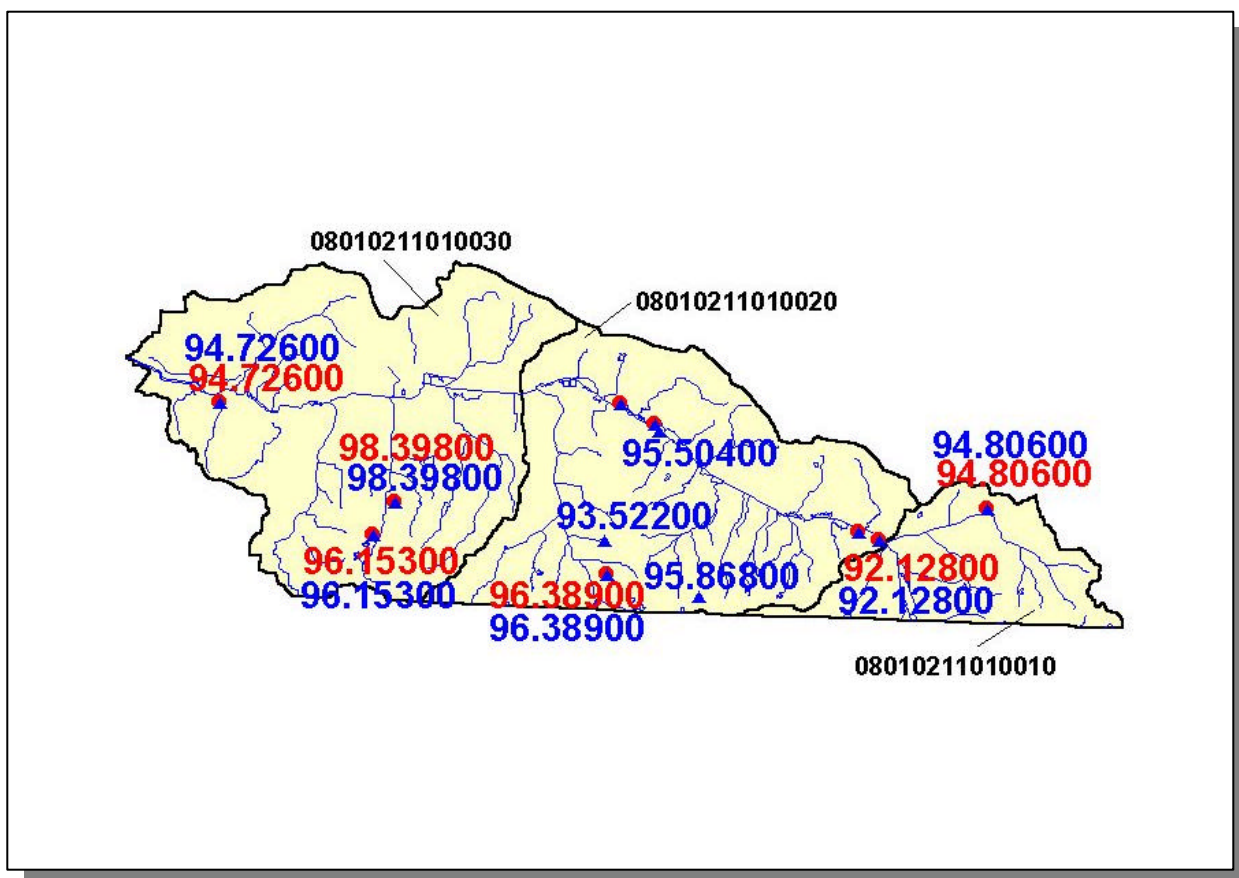
4.2.A.ii Point Source Contributions.



**Figure 4-7. Location of Active Point Source Facilities (Individual Permits) in Subwatershed 08010211020.** Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. More information, including the names of facilities, is provided in Nonconnah-Appendix IV.



**Figure 48. Location of ARAP Sites (Individual Permits) in Subwatershed 08010211020.** Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.



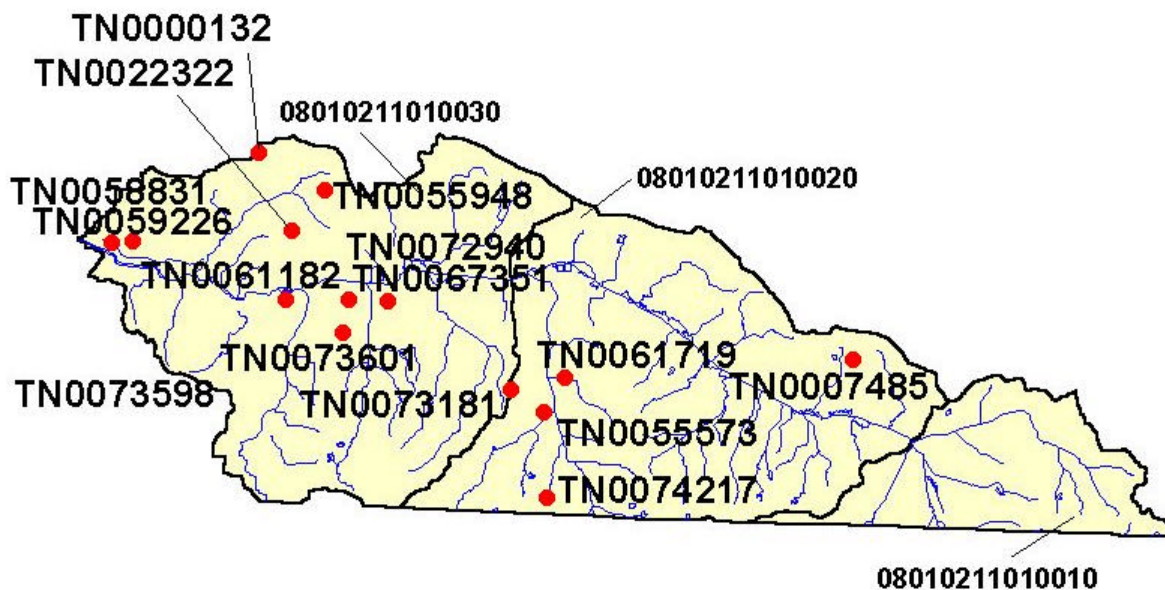
**Figure 4-9. Location of Wetland Impact and Mitigation Sites in Subwatershed 08010211020.** Impact (Blue Triangle) and mitigation (Red Circle) sites are from ARAP database. Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.

#### 4.2.A.ii.a. Dischargers to Waterbodies Listed on the 1998 303(d) List.

There are fifteen NPDES facilities discharging to water bodies listed on the 1998 303(d) list in Subwatershed 08010211020:

- TN0000132 discharges to Mile 1.2 of a Wet Weather Conveyance to Cane Creek @ RM 2.8
- TN0022322 discharges to Nonconnah Creek @ RM 6.9
- TN0055573 discharges to Johns Creek @ RM 4.0
- TN0055948 discharges to a Wet Weather Conveyance to an Unnamed Tributary to Cane Creek @ RM 4.1
- TN0058831 discharges to Nonconnah Creek @ RM 1.25

- TN0059226 discharges to Nonconnah Creek @ RM 0.2, Latham Bayou @ Mi 1.2, and McKellar Lake @ Mi 0.5, Mi 6.2 of an Unnamed Tributary, and Mi 0.3 of a Tributary to Latham Bayou
- TN0061182 discharges to a drainage ditch to Nonconnah Creek @ RM 5.6
- TN0061719 discharges to a ditch to Johns Creek @ RM 3.6
- TN0007485 discharges to Mile 2.6 of an Unnamed Tributary to Nonconnah Creek @ RM 19.7
- TN0067351 discharges to Unnamed Tributaries to Nonconnah and Hurricane Creeks and to Hurricane Creek
- TN0072940 discharges to a Tributary to Nonconnah Creek, Days Creek, Hurricane Creek, and Nonconnah Creek
- TN0073181 discharges to Unnamed Tributary to Johns Creek @ RM 3.05
- TN0073598 discharges to a Ditch to Nonconnah Creek and to Hurricane Creek
- TN0073601 discharges to a drainage ditch to Nonconnah Creek
- TN0074217 discharges to a Drainage Ditch to Johns Creek Lateral "B"



**Figure 4-10. Location of NPDES Dischargers to Water Bodies Listed on the 1998 303(d) List in Subwatershed 08010211020.** Subwatershed 08010211010010, 08010211010020, and 08010211010030 boundaries are shown for reference. The names of facilities are provided in Nonconnah-Appendix IV.

PERMIT #	7Q10	1Q20	30Q2	QLTA	QDESIGN
TN0000132	0	0	0	2.0088	0.007
TN0022322	0	0	0	3.36	
TN0055573	0	0	0	0.4178	
TN0055948	0	0	0	0.065	
TN0058831	0	0	0	0.0247	
TN0059226	0	0	0	0.0746	
TN0061182	0	0	0	0.0021	
TN0061719	0	0	0	0.0015	
TN0066966	0	0	0		
TN0067351	0	0	0	7.58	
TN0072940	0	0	0	0.0002	
TN0073181	0	0	0	0.0012	
TN0073598	0	0	0	0.2507	
TN0073601	0	0	0	0.00053	
TN0074217	0	0	0	0.00165	

**Table 4-5. Receiving Stream Flow Information for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.** Data are in million gallons per day (MGD). 30Q2 data were calculated using data in Flow Duration and Low Flows of Tennessee Streams Through 1992.

PERMIT #	CBOD <sub>5</sub>	FECAL	NH <sub>3</sub>	METAL
TN0055573			X	X
TN0055948	X		X	
TN0059226	X		X	
TN0061182	X			
TN0061719				X
TN0067351	X			
TN0073598	X			

**Table 4-6. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.**

PERMIT #	Ag	As	Cd	Cr	Cu	Fe	Hg	Ni	Pb	Se	Zn	TRC	COD	TSS	SETTLABLE SOLIDS	BOD
TN0000132														X		X
TN0022322														X		
TN0055573					X						X					
TN0059226												X	X			
TN0061182														X	X	
TN0061719						X										
TN0067351														X	X	
TN0073181	X	X	X	X	X		X	X	X	X	X			X		
TN0073598														X		
TN0073601														X		
TN0074217												X		X		

**Table 4-7a. Inorganic Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.**

PERMIT #	O&G	ETHYL-BENZENE	BENZENE	TOLUENE	XYLENE	PHENOL
TN0000132	X					
TN0022322	X					
TN0059226	X	X	X	X	X	X
TN0061182	X					
TN0067351	X	X	X	X	X	
TN0073598	X					
TN0073601	X					
TN0074217	X					

**Table 4-7b. Organic Parameters Monitored for Daily Maximum (mg/L) Limits for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.**

PERMIT #	Cu	Cr	Hg	Pb	Se	Zn	TSS	BOD	TRC	SETTLABLE SOLIDS	DMR DATES
TN0000132								1			01/1990-09/1999
TN0022322							4				01/1995-06/2000
TN0055573	22			11		23	4		1	2	07/1990-09/1999
TN0067351							3	5			01/1998-06/2000
TN0073181	16	2	2	3	1	21	25				06/1995-06/1999
TN0073598							3	2			01/1996-06/2000
TN0074217							1		1		01/1997-12/1999

**Table 4-8a. Number of Permit Violations Based on DMR Data for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.**

PERMIT #	O&G	ETHYL-BENZENE	BENZENE	TOLUENE	XYLENE	PHENOL	DMR DATES
TN0000132	8						01/1990-09/1999
TN0022322	3						01/1995-06/2000
TN0059226	6	3	1	1	1	7	01/1998-06/2000
TN0067351	2						01/1998-06/2000

**Table 4-8b. Number of Permit Violations Based on DMR Data for NPDES Dischargers to Waterbodies Listed on the 1998 303(d) List in Subwatershed 08010211020.**

#### 4.2.A.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)			
Beef Cow	Cattle	Chickens	Sheep
205	412	14	68

**Table 4-9. Summary of Livestock Count Estimates in Subwatershed 08010211020.** According to the 1997 Census of Agriculture, "Cattle" includes heifers, heifer calves, steers, bulls and bull calves.

County	INVENTORY		REMOVAL RATE	
	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Fayette	152	152	1.1	3.3
Shelby	111.6	111.6	0	0
<b>Totals</b>	<b>263.6</b>	<b>263.6</b>	<b>1.1</b>	<b>3.3</b>

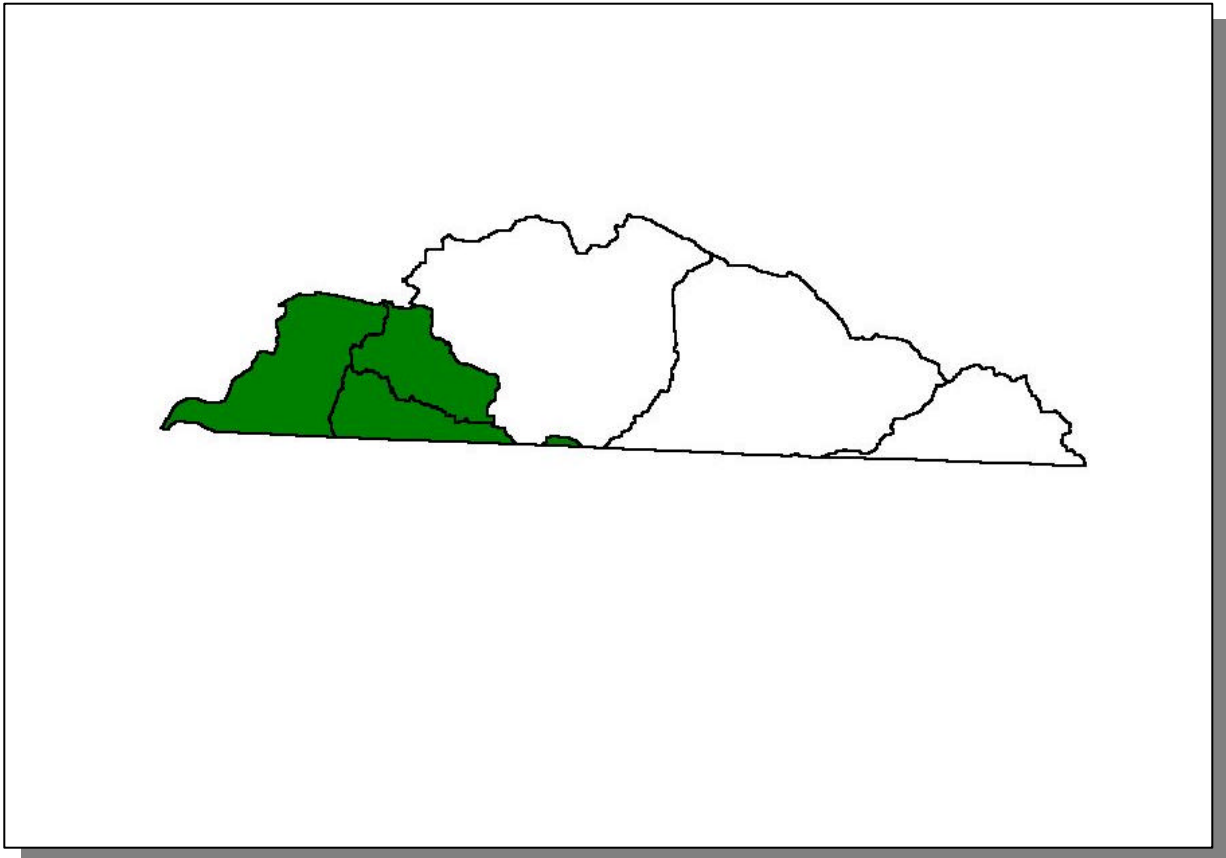
**Table 4-10. Forest Acreage and Annual Removal Rates (1987-1994) in Subwatershed 08010211020.**

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	6.00
Soybeans (Row Crops)	12.05
Cotton (Row Crops)	10.63
Other Cropland not Planted	8.37
Grass (Pastureland)	0.36
Forest Land (Not Grazed)	0.00
Non Agricultural Land Use	0.00
Sorghum (Row Crops)	4.91
Other Vegetable and Truck Crop	5.87
Wheat (Close Grown Cropland)	4.23
Grass (Hayland)	0.09
Legume (Hayland)	4.46
Summer Fallow (Other Cropland)	12.43
Grass, Forbs, Legumes (Mixed Pasture)	0.24
Farmsteads and Ranch Headquarters	0.45
Conservation Reserve Program Land	0.79
Forest Land (Grazed)	0.00
Legume Grass (Hayland)	0.22
Fruit (Horticultural)	0.39

**Table 4-11. Annual Estimated Total Soil Loss in Subwatershed 08010211020.**



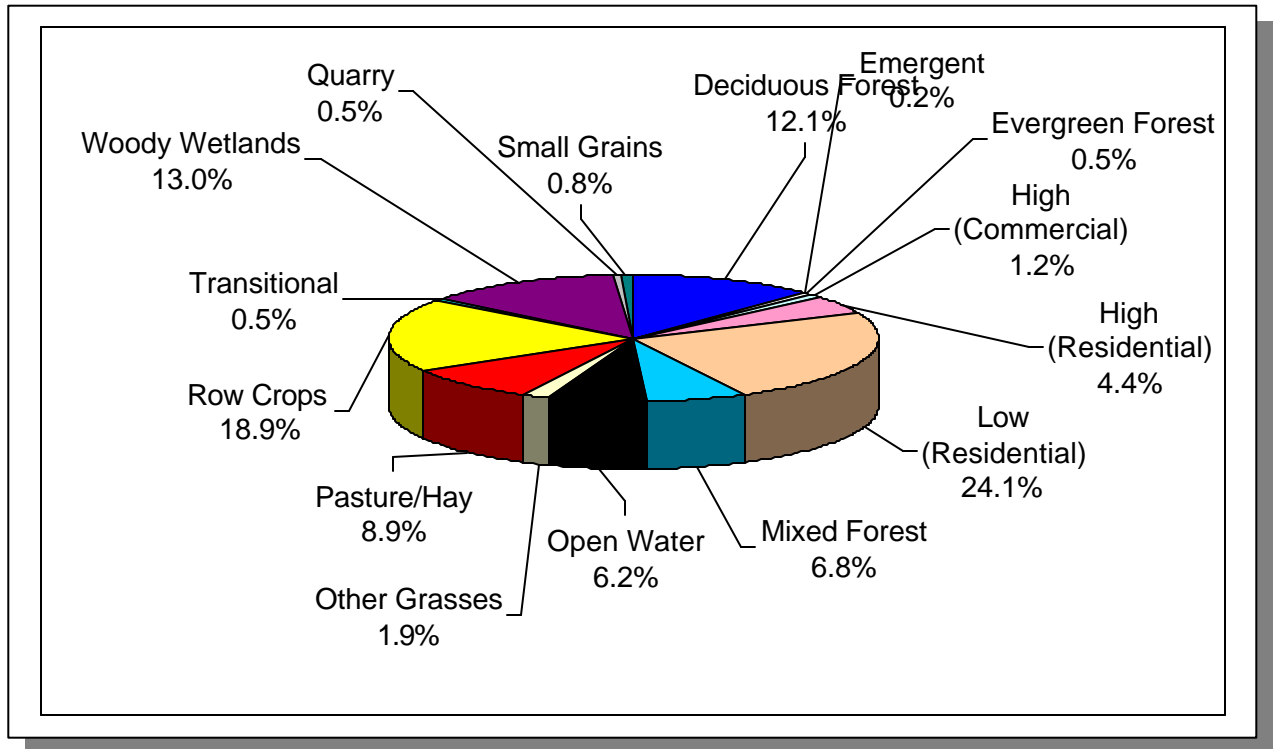
**4.2.B. 08010211040.**



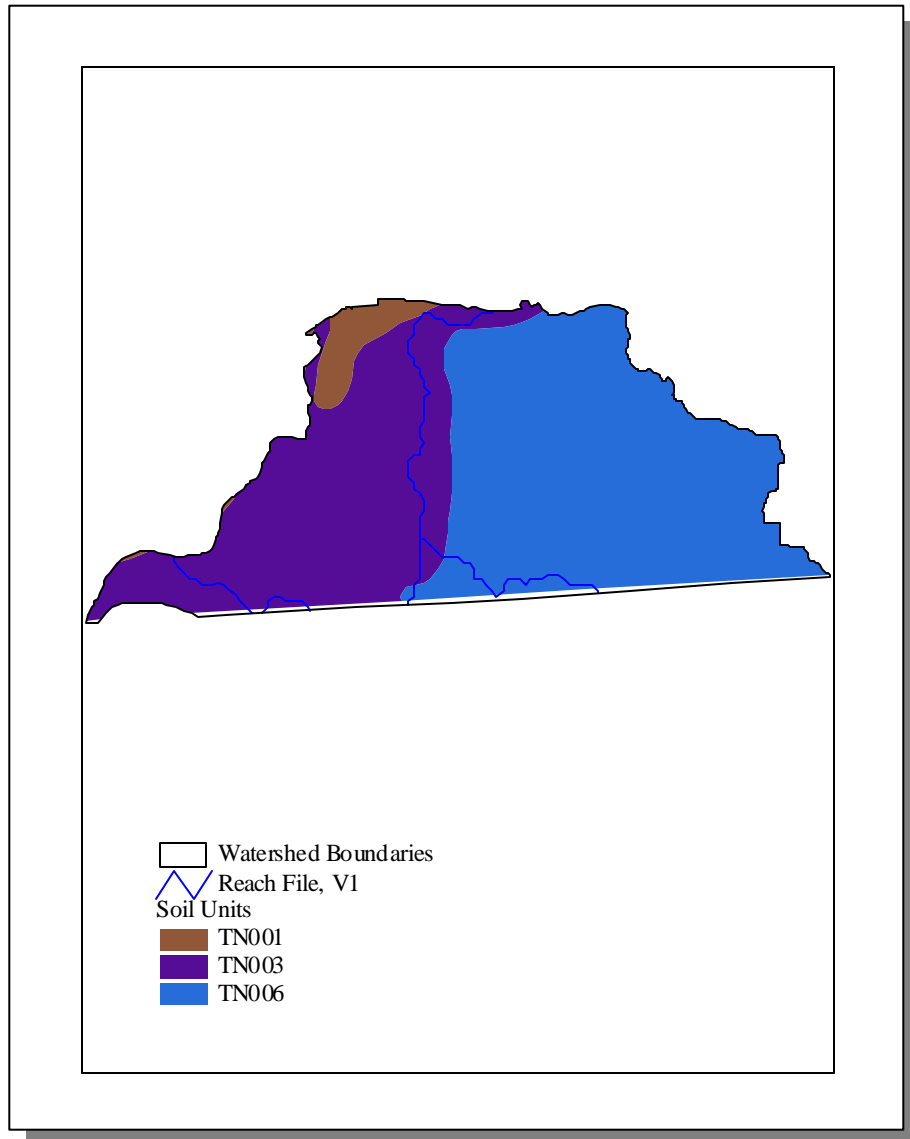
**Figure 4-11. Location of Subwatershed 08010211040.** All Nonconnah HUC-14 subwatershed boundaries are shown for reference.



4.2.B.i. General Description.



**Figure 4-12. Land Use Distribution in Subwatershed 08010211040.** More information is provided in Nonconnah-Appendix IV.



**Figure 4-13. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 08010211040.**

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN001	14.00	C	2.31	7.00	Silty Loam	0.33
TN003	62.00	C	0.50	6.65	Silty Clay	0.33
TN006	0.00	C	1.30	5.42	Silty Loam	0.48

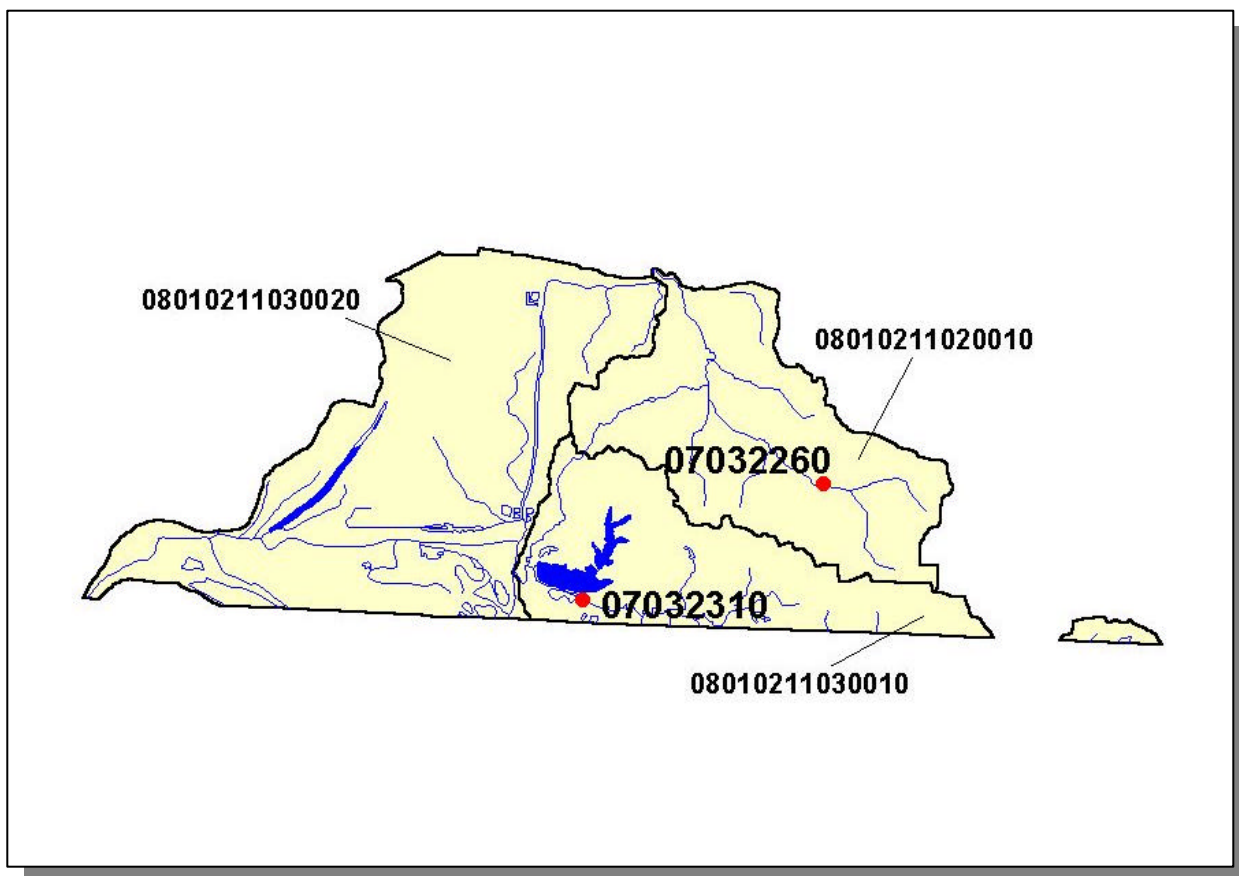
**Table 4-12. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 08010211040.** More information is provided in Nonconnah-Appendix IV.

	COUNTY POPULATION			ESTIMATED POPULATION IN WATERSHED		% CHANGE
County	1990	1997 Est.	Portion of Watershed (%)	1990	1997	
Shelby	826,330	865,318	5.3	43,798	45,865	4.7

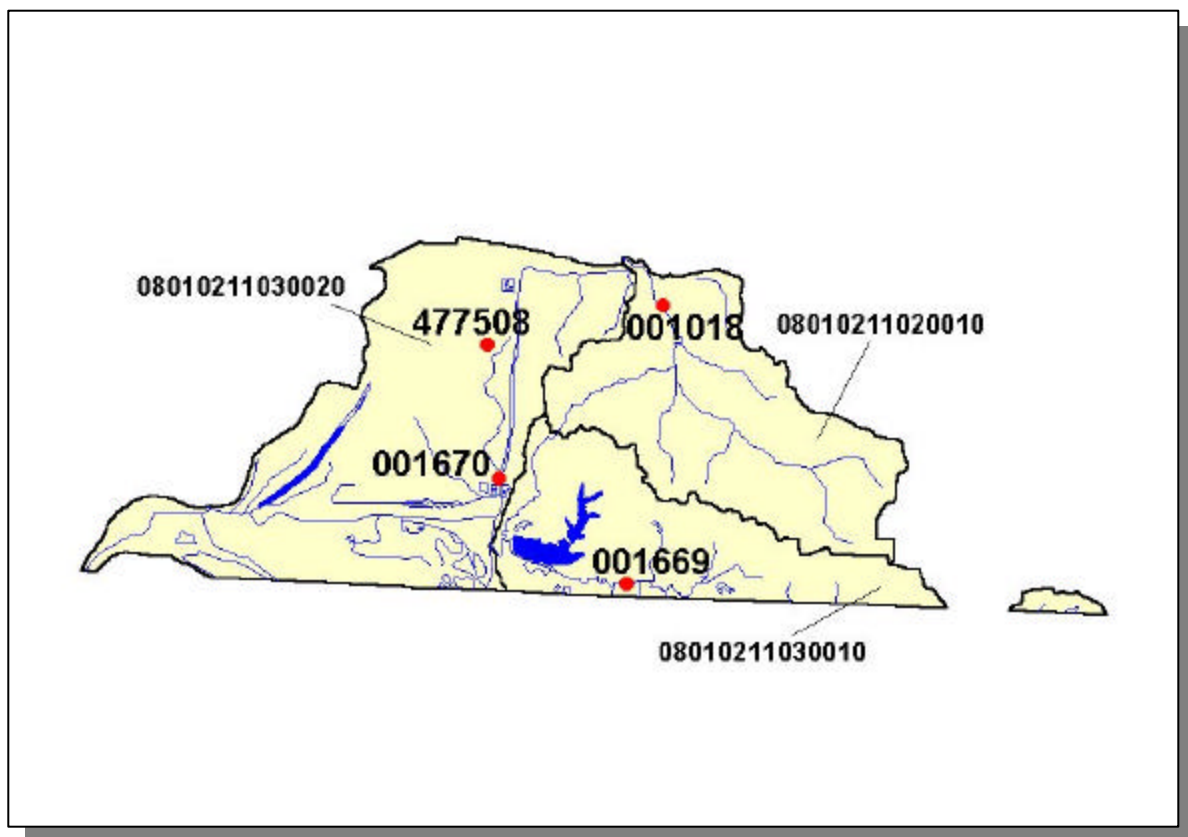
*Table 4-13. Population Estimates in Subwatershed 08010211040.*

Populated Place	County	Population	NUMBER OF HOUSING UNITS			
			Total	Public Sewer	Septic Tank	Other
Memphis	Shelby	610,337	248,573	247,138	793	642

*Table 4-14. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 08010211040.*

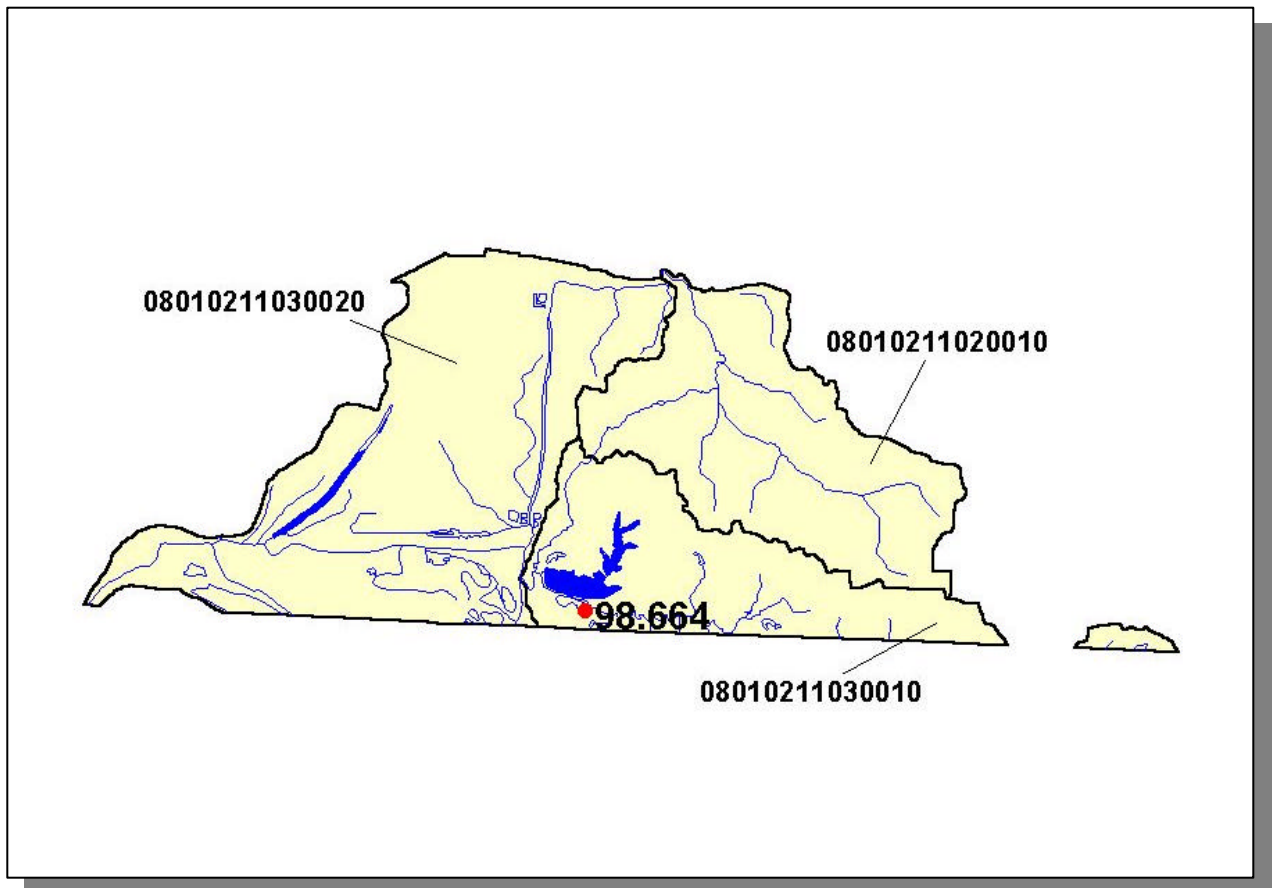


**Figure 4-14. Location of Historical Streamflow Data Collection Sites in Subwatershed 08010211040.** Subwatershed 08010211020010, 08010211030010, and 08010211030020 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.

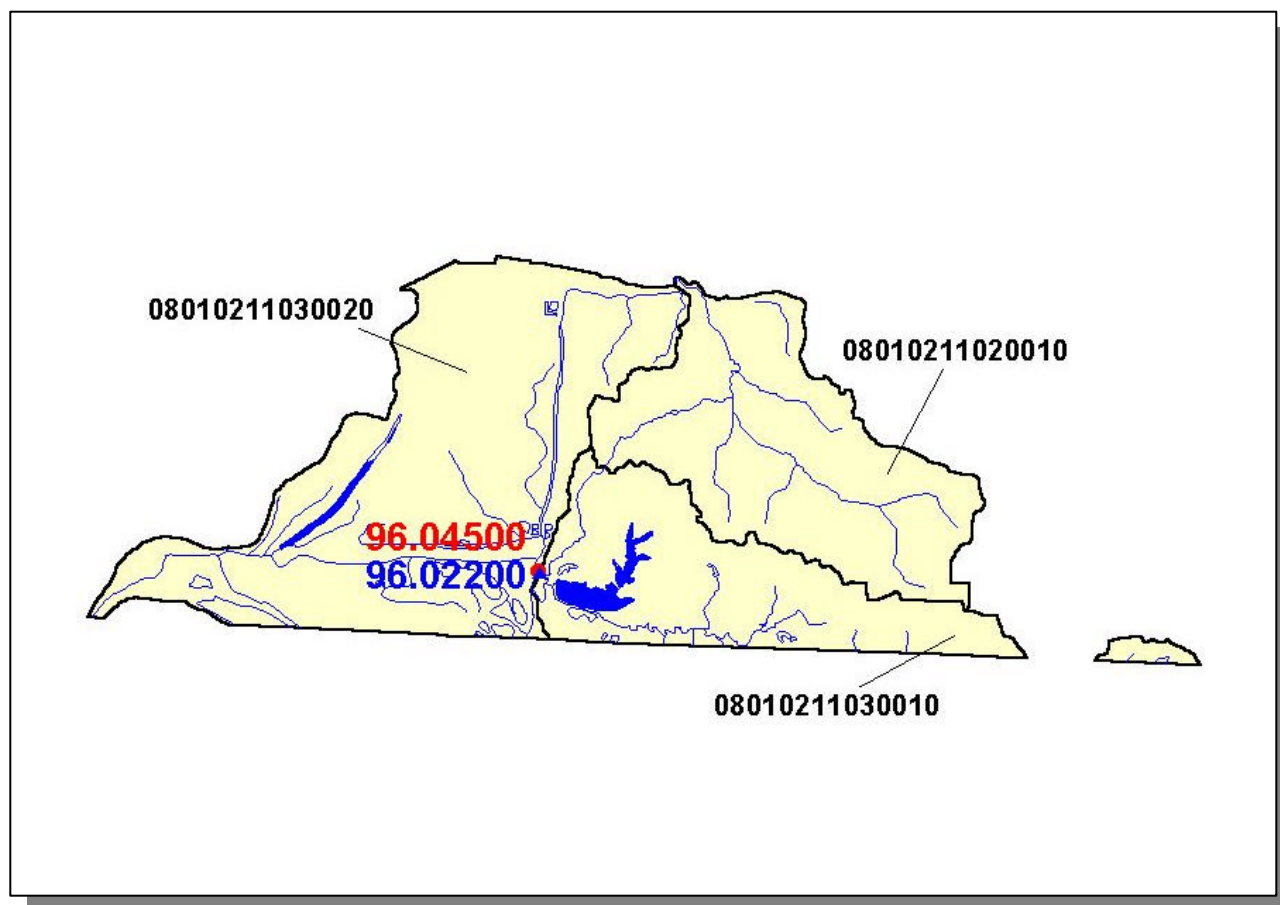


**Figure 4-15. Location of STORET Monitoring Sites in Subwatershed 08010211040.** Subwatershed 08010211020010, 08010211030010, and 08010211030020 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.

**4.2.B.ii.** Point Source Contributions.



**Figure 4-16. Location of ARAP Sites (Individual Permits) in Subwatershed 08010211040.** Subwatershed 08010211020010, 08010211030010, and 08010211030020 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.



**Figure 4-17. Location of Wetland Impact and Mitigation Sites in Subwatershed 08010211040.** Impact (Blue Triangle) and mitigation (Red Circle) sites are from ARAP database. Subwatershed 08010211020010, 08010211030010, and 08010211030020 boundaries are shown for reference. More information is provided in Nonconnah-Appendix IV.

#### 4.2.B.iii. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)			
Beef Cow	Cattle	Chickens	Sheep
45	88	<5	17

**Table 4-15. Summary of Livestock Count Estimates in Subwatershed 08010211040.** According to the 1997 Census of Agriculture, "Cattle" includes heifers, heifer calves, steers, bulls and bull calves.

County	INVENTORY		REMOVAL RATE	
	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Shelby	111.6	111.6	0	0

**Table 4-16. Forest Acreage and Average Annual Removal Rates (1987-1994) in Subwatershed 08010211040.**

CROPS	TONS/ACRE/YEAR
Corn (Row Crops)	5.91
Soybeans (Row Crops)	12.07
Cotton (Row Crops)	10.64
Other Cropland not Planted	8.41
Grass (Pastureland)	0.36
Forest Land (Not Grazed)	0.00
Non Agricultural Land Use	0.00
Sorghum (Row Crops)	4.91
Other Vegetable and Truck Crop	5.87
Wheat (Close Grown Cropland)	4.24
Grass (Hayland)	0.09
Legume (Hayland)	4.49
Summer Fallow (Other Cropland)	12.43
Grass, Forbs, Legumes (Mixed Pasture)	0.23
Farmsteads and Ranch Headquarters	0.45
Conservation Reserve Program Land	0.79
Forest Land (Grazed)	0.00

**Table 4-17. Annual Estimated Total Soil Loss in Subwatershed 08010211040.**